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COLLEGE OF MEDICINE AND HEALTH SCIENCES

INSTITUTE OF PUBLIC HEALTH

PREVALENCE OF SMEAR POSITIVE TUBERCULOSIS AND ASSOCIATED FACTORS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CARE, NORTWEST ETHIOPIA.

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EXAMOINNER

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List of Abbreviation and Acronomis

AFB	Acid Fast Bacilli
AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal Care
BCG	Bacille-Calmette-Guerin
CI	Confidence Interval
DOTs	Directly Observed Treatment
FM	Fluorescent Microscope
GDP	Gross Domestic Product
HBCs	High Burden Countries
HC	Health Center
HIV	Human Immune Deficiency Virus
LED	Light Emitting Diode
MCH	Maternal and Child Health
MDG	Millennium Development Goal
MTB	Mycobacterium Tuberculosis
NGO	Non Governmental Organization
PTB	Pulmonary Tuberculosis
SOP	Standard Operation Procedure
SPSS	Statistical Package for Social Science
TB	Tuberculosis
TST	Tuberculin Skin Test
UK	United Kingdom

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Abstract

Background Little is known about the burden of TB and associated factors among pregnant women in resource poor settings.

Objective: To assess the prevalence of smear positive tuberculosis and associated factors among pregnant women attending antenatal care service.

Method: This study employed institution based cross-sectional study in Northwest Ethiopia. All pregnant women in North Gondar Zone were used as a source population. Sample was estimated using Open-Epi soft ware and all hospitals in North Gondar Zone were included in the study. Data were collected by using interview administered questionnaire and three sputum (spot-morning-spot) samples were collected from those pregnant women who had cough. Sputum smear was done by using Light Emitted Diode Florescent Microscope.

Data were entered using Epinfo version 3.5 statistical software. The statistical Package for the Social science/SPSS Version 20.0 was also employed for descriptive and logistic regression analysis.

Result: A total of 1272 pregnant women were screened for TB. The prevalence of smear-positive TB was 864/100,000 pregnant women (95% CI: 402-1122). Higher rates of smear-positivity were observed among HIV positive [AOR= 7.24; 95% CI: (2.01-26.03)], rural residents [AOR=5.55; 95% CI: (1.398-22.068)] and family history of TB [AOR=55.78; 95% CI: (12.373-251.536)]

Conclusion

This study revealed higher rates of smear-positive TB. Being HIV positive, rural residence, and family history of tuberculosis were identified as possible associated risk factors of smear-positive tuberculosis. Strengthening the existing health education about transmission, screening of pregnant women who had cough for two weeks or more, and strengthening collaboration of TB and HIV with antenatal care clinics were recommended.

Keywords: *cross-sectional, LED Fluorescent microscope pregnant women, Risk factor, Smear-positive,*

1. Introduction

1.1 Background and Statement of the problem

Even at the moment after the accessibility of successful anti TB drugs for more than half a century, TB remains a major cause of global morbidity and mortality. One-third of world's population is estimated to be infected with MTB [1, 2]. There were about 8.6 million new TB cases (together with 4.1 million new smear-positive cases) and 410,000 women pass away per annum, in which it disproportionally affects women of the reproductive age groups(15-44) year [2].

Geographically, the load of TB is highest in developing countries. India and China shared almost 40% of the world's TB cases; the South-East Asia and Western Pacific region account for 60%. The African Region has around one quarter of the world's cases, and the maximum rates of cases and deaths comparative to population [1, 2].The prevalence of active TB in pregnant and postpartum women from high burden countries like India which accounts to be (19%-34%). Kenya, South Africa and Rwanda (>60 TB cases per 100 000 population annually) and low-burden tuberculosis countries, UK, USA (<20 cases per 100 000 population per year or <10 cases of total population) were reported. Rates of active tuberculosis ranges from 0.7% to 7.9% among HIV-positive women in high-burden countries, and is as high as 11% if they are positive for tuberculin skin test (TST) [2, 3]. High-burden countries may miscalculate prevalence because many women do not have contact to healthcare when pregnant[2].Few countrywide programs gather or account pregnancy-related tuberculosis data to the World Health Organization (WHO).

Data from sub-Saharan Africa, show the consequence of Mycobacterium tuberculosis infection as a main cause of maternal mortality, especially in the context of HIV co infectivity[4, 5]. Mycobacterium tuberculosis/HIV co-infection is frequent, in areas of high TB incidence and prevalence. In a review of maternal mortality in Johannesburg, South Africa, 70% of death in women were HIV-related, rather than death from obstetric causes, and mainly from TB and pneumonia[5].

Ethiopia is categorized among the 22 High Burden Countries (HBCs) and rank seventh [2] and TB account for the major percentage of hospital admission and reported as being the third principal cause of hospital deaths second to malaria and obstetric cases [6]. In the year 2012, Ethiopia TB and Leprosy control, the nationwide approximate prevalence, incidence and mortality rates of TB were 294, 261 and 35 per 100,000 population respectively, whereas smear-positive PTB (SPPTB) cases were estimated to be 46,634 amongst adults aged above 15 years [6]. And a study in North west Ethiopia in 2011, prevalence of sputum smear positive tuberculosis were 178/100,000 population, age greater or equal to 14, [7] and there were high rates of smear positive tuberculosis among females and prevalence of smear positive case detection rate through active case finding were 3.3 times higher for females than male[7]. Different population based researches in Ethiopia under smear positive tuberculosis found that females are found to be more prevalent than male[7, 8]

These facts remain about pregnancy and tuberculosis, the exact prevalence of tuberculosis in pregnancy does not readily exist in many countries due to a lot of confounding factors. Amongst African women in the early reproductive years case finding rate of sputum smear positive tuberculosis is 1.6-2.4 times higher than in women age 44 and older and other population segments [9]. Mean while Antenatal care is a vital spot of contact of pregnant women, to assess and access regular screening for TB in pregnant women, it is not ordinary practice in many settings which leads hindrance in diagnosis, maternal and child mortality and there is no clear research done on the prevalence of smear positive tuberculosis and factors which contribute to the burden of tuberculosis in pregnant women in the study area or even in Ethiopia. So that, this study primarily focuses on the prevalence of smear-positive tuberculosis and associated factors among pregnant women attending ANC service, in North Gondar Zone, northwest Ethiopia.

1.2 Literature review

Tuberculosis is a communicable disease caused by the bacillus *Mycobacterium tuberculosis*. It characteristically affects the lungs (pulmonary TB) but can affect other sites as well (extra pulmonary TB). The disease is spread in the air when peoples who are sick with pulmonary TB expel bacteria, for example by coughing. In general, a relatively small proportion of people infected with Mycobacterium tuberculosis will develop TB disease; however, the chance of developing TB is much higher among people infected with the human immunodeficiency virus (HIV) and women in underprivileged surroundings of reproductive age and without treatment mortality rates are high[1].

1.2.1 Magnitude of tuberculosis in pregnant women

An intensified case finding study in South Arica, by sputum sampling for pulmonary tuberculosis confirm the prevalence of tuberculosis among pregnant women was high which is(3.3%) [3]. In addition another study in Tanzania, Dar Es Salam in 2009, sputum microscopy/smear positive tuberculosis among women attending MCH and family planning was 3.8%[9]. Of 5731 pregnant women attending ANC in Nsanje district, Malawi, 22 were registered smear positive PTB, giving an annual case notification rate of 384 per 100,000 pregnant women and the study conclude that smear positive pulmonary tuberculosis case notification rate was over twice as high as in pregnant compared to non pregnant women[10].

Ethiopia carries the highest burden of TB in the Horn of Africa [1] and it stands 7th among the 22 high-burden countries in the world[11]. The national TB notification rate (prevalence and incidence) of tuberculosis cases was 250 and 290 per 100,000 populations respectively a report of WHO 2012, and over all smear positive tuberculosis become 284 per 100,000 population[1]. In 2013 a community based cross sectional study in Dabat district, North West Ethiopia shows the prevalence of smear positive tuberculosis among adults age ≥14 was 174 per 100,000 which was greater more than half from a study in southern part of Ethiopia, which was 78 per 100,000 population and from here there were high rates of smear positive tuberculosis which is females are 3.2

times more likely to be AFB positive than males, that is in the study area Dabat District out 41 positive for AFB 32 were women. And they conclude that two third of smear positive tuberculosis cases in the community were undiagnosed in the study area[7, 12].

1.2.2 Risk Factors contributing to tuberculosis during pregnancy

There are different risk factors associated with tuberculosis infection, especially during pregnancy.

Socio demographic factor

The risk of acquiring TB infection increases with age from early life to early adult life, probably, because of increasing number and rate of frequency of contacts[13]. TB is mainly a disease of adults in the age group of 15 - 49 years.

In most settings, TB incidence rates are higher for males at all ages except in childhood, when they are higher in females. Studies have reported that sex differentials in prevalence rates begin to emerge between 10 and 16 years of age, and stay higher for males than females afterward[14]. TB is the 3rd leading cause of death worldwide among women aged between 15 and 44 years and it is the 4th leading cause of death among women aged 10-19 years in low income countries. Once infected, women of reproductive age are more susceptible to developing TB than men of the same age.

Although the impact of gender dynamics on TB detection and treatment has not been studied comprehensively, but there are some clear associations. Gender-related barriers can impact women's access to TB information and services, which contribute to late or missed case detection in women. Where women do not control family property, they often delay in looking for medical care. On the other hand, women are not permitted to leave the home without permission, and are afraid of being seen going to a TB clinic, and they often miss health promotion programs and remain unaware of TB symptoms. Where women suffer stigma and discrimination related to their HIV or TB status, they may not seek treatment for fear of rejection. Some studies have shown that women wait up to twice as long as men to seek treatment for TB, which can increase the severity of their sickness, decrease the success of treatment, and raise the risks

that they will infect others. Different data's suggest, however, that once in treatment, women in many settings are more likely than male counterpart to complete treatment [11, 14].

Socio Economic and Environmental Factor

Tuberculosis has been associated with factors linked to socioeconomic scarcity: uch as poverty, overcrowding and malnutrition, were commonly faced by women in resource limited countries. Of the 22 countries that are home to 80 percent of the world's people with active TB, 17 have an annual Gross Domestic Product (GDP) of less than US $760[15]. since women account for about 70 percent of the world's poor, in developing countries they are disproportionately affected by the disease[15, 16]. This poses a significant challenge to TB control, as poor women are less likely to seek medical care.

The association between TB and poverty was shown by the decline in TB burden with the better living situation in developed countries prior to the introduction of treatment. Improved living condition was also found to reduce the risk of infection from 4- 6 % per annum. On the contrary, certain aspects of poverty make women more vulnerable to develop active TB. Cramped living conditions, overcrowding, and poor ventilation ease the spread of TB bacteria. In addition, women living in poverty are at an increased risk of becoming commercial sex workers. Millions of women and girls are forced into commercial sex work each year; over one million girls are from India alone. Women and girls who engage in sex work are at an increased risk of contracting TB from clients. This risk is exacerbated by their confined living conditions and susceptibility to HIV[17-19]. Crowding increases the risk of exposure by increasing the likelihood of contact between susceptible persons and infectious tuberculosis cases as well as the intimacy of exposure.

Women's social roles place them at a higher risk of contracting TB. Indoor food preparation is particularly connecting to TB. In developing countries, women often cook indoors in very confined spaces using biomass fuel such as wood or animal dung. Studies showed that women who cook with biomass fuel are more likely to develop

active TB[16, 20]. It is believed that smocks from fuels can weaken women's respiratory systems and impair the immune system's ability to fight off bacteria [1].

Residence also play a vital role of an important factor for tuberculosis infection and development that is more TB patients were reported from urban than rural areas because of overcrowding, poverty and HIV infection [20]

Clinical diseases

The incidence of TB was reported greatest among people with impaired immunity, HIV infection, or diabetes[21]. A multifaceted interaction exists between TB and HIV infection. HIV increases the risk of infection, as it reactivates LTBI and increases the progression to active disease. A number of studies have confirmed the contribution of HIV in maternal mortality and morbidity[22, 23]. Prevalence of TB in HIV-infected pregnant women in South Africa is similar to that of the general population: approximately 795/100 000[24]. In 2009, the prevalence of active TB in HIV infected women attending antenatal care in Soweto, was found to be 688/100 000; higher than the prevalence in HIV-uninfected women (201/100 000). Similar study in Nigeria HIV infection and TB during pregnancy is a particularly lethal combination which is in dependent risk factors for maternal mortality[25]. In a study of maternal mortality in South Africa, there was a 3.2-fold increase in the relative risk of death in mothers with TB-HIV co-infection, compared with HIV-uninfected mothers with TB infection, and 54% of maternal deaths caused by TB were attributable to co-infection with HIV[4, 23]. In Zambia, TB accounts for 25% of all non obstetric maternal deaths, most of these among women with TB-HIV co-infection[22]. There are also some studies in Ethiopia that HIV infected pregnant women have high prevalence of tuberculosis than non HIV pregnant women. An institution based cross sectional study on the prevalence of smear positive tuberculosis among diabetic's patients in Dessie referral hospital North east Ethiopia shows 6.2% pulmonary tuberculosis which is higher when compared to the general population in the study area[21].

Behavioral factor

Furthermore the social and demographic factors, lack of education, smoking habit, drug addiction etc. contribute to the incidence and transmission of TB among pregnant women[26].

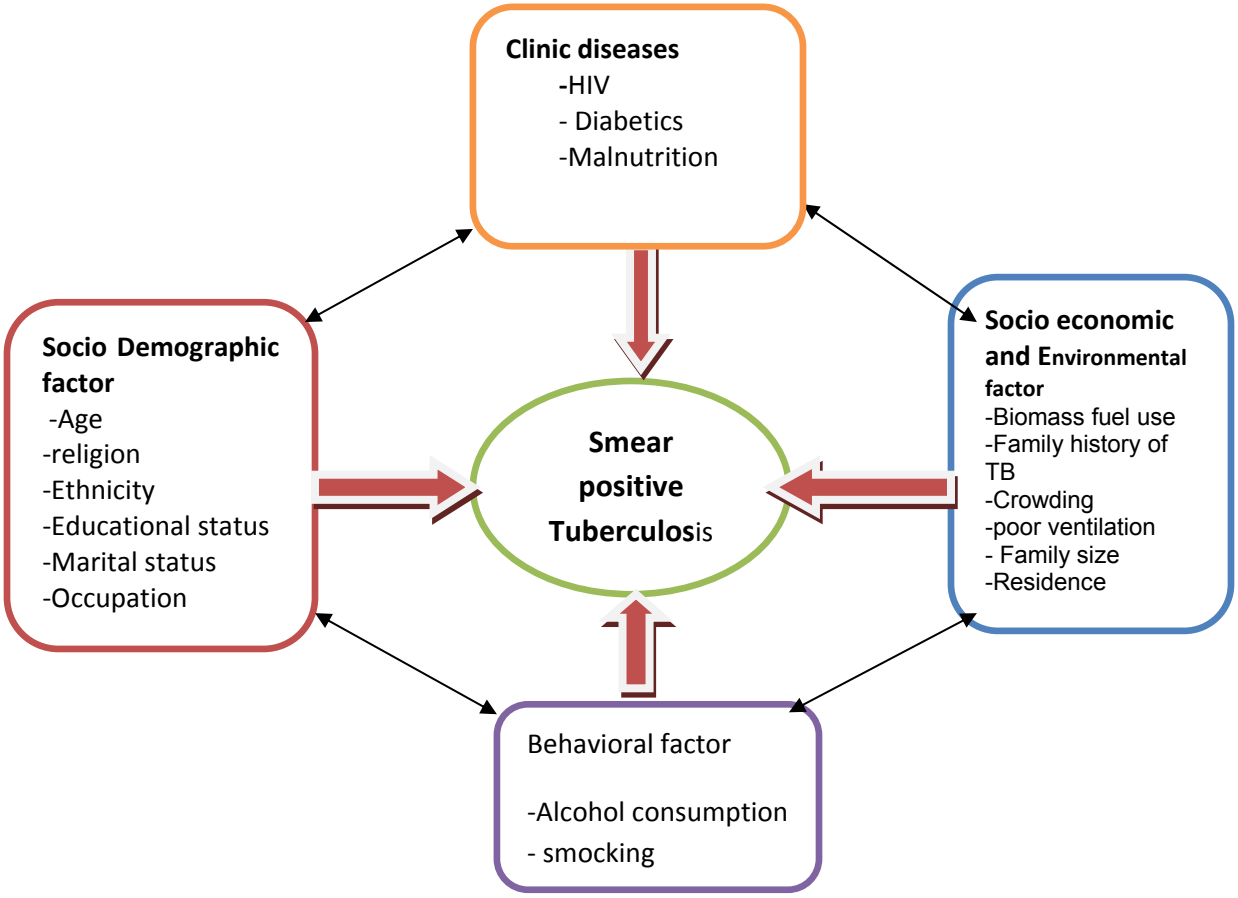

Figure 1: Conceptual framework on prevalence of smears positive TB and associated factors among pregnant women attending ANC in North Gondar Zone Hospitals, Northwest Ethiopia, 2014 (Source: WHO and diferrent Litratures)

1.3 Justification

Finding tuberculosis in the most vulnerable groups, women in reproductive age are an urgent priority. Reduction of tuberculosis transmission, morbidity and mortality relays largely on intensified case finding and sputum screening with consequence early initiation of adequate treatment[3]. This is particularly important among pregnant women in resource limited settings where tuberculosis is a cause of non obstetrical or indirect maternal death [1,2]. And control tuberculosis transmission from mother to child and death due to TB. This is the key strategy towards meeting MDG (halt the spread and TB incidence by 2015) and contributes the reduction in child and maternal mortality goal 4 and 5. So that this study will helps to measure the burden of tuberculosis among pregnant women in the study area and factors which may contribute to TB during pregnancy, and will provide base line information to link tuberculosis screening at ANC service in which large number of women could be opportunistically screened for TB, which make active case finding cost effective and sustainable.

2. Objectives

2.1 General objective

To determine the prevalence of smear-Positive tuberculosis and associated factors among pregnant women attending ANC in North Gondar Zone Hospitals, North west Ethiopia.

2.2 Specific objectives

1. To measure the prevalence of smear positive tuberculosis.
2. To identify factors associated with tuberculosis.

3. Methods

3.1 Study design and period

Institution based cross sectional study was used to estimate the prevalence of smear positive tuberculosis and associated factors among pregnant women from March to May 2014.

3.2 Study area

The study was conducted in hospitals of North Gondar Zone. North Gondar is found at an altitude of 2100 to 2870 meters above sea level to the North West of the Country and is 748 km far from the capital, Addis Ababa.[27]

North Gondar zone is the largest zone in Amhara region and it is divided into 24 woredas of which there are four city administration woredas and 576 kebeles. North Gondar Zone had a total population of 3,286,351, which live in 44,868.44sq.km [27]and there are 3 hospitals, 132 health centers and 566 health posts by this the total health service coverage is 97% and ANC service coverage of 95.8% [27].

3.3 Source population

All pregnant women in North Gondar Zone were taken as the source population.

3.4 Study population

The study population was pregnant women who attended antenatal care during the study period in selected Hospitals.

3.5 Inclusion criteria

All pregnant women ≥18 year of age presenting to the hospitals for ANC service were eligible to participate.

3.6 Exclusion criteria

Women who were unable to provide verbal consent, critically ill with other obstetrics case were excluded.

3.7 Sample size determination

Sample size was determined by using OpenEpi version 2.3, soft ware with the following assumptions

- taking the total pregnant women attending ANC 13450
- prevalence of tuberculosis3.8% [28]
- 95% confidence level and
- 1% of margin of error

With this assumption the final sample size was**1272**.

3.8 Sampling procedure and technique

All Hospitals in the study area are taken by doing so, each hospital ANC service 2013/2014 plan (13450) taken as a source population and pregnant women flow was estimated by each hospital was 41, 23 and 18 for UoG referral hospital, Debark hospital, and Metema hospital respectively each day. We use systematic random sampling technique, in which every 2^{nd} member study units that was available at the time of data collection and who express their willingness were included in the sample. From a total of 2546 antenatal care attendants, 1272 study subjects from the three hospitals were included in the study.

Distribution of the estimated sample size to each hospital was done by using a simple population proportion formula as follows:-

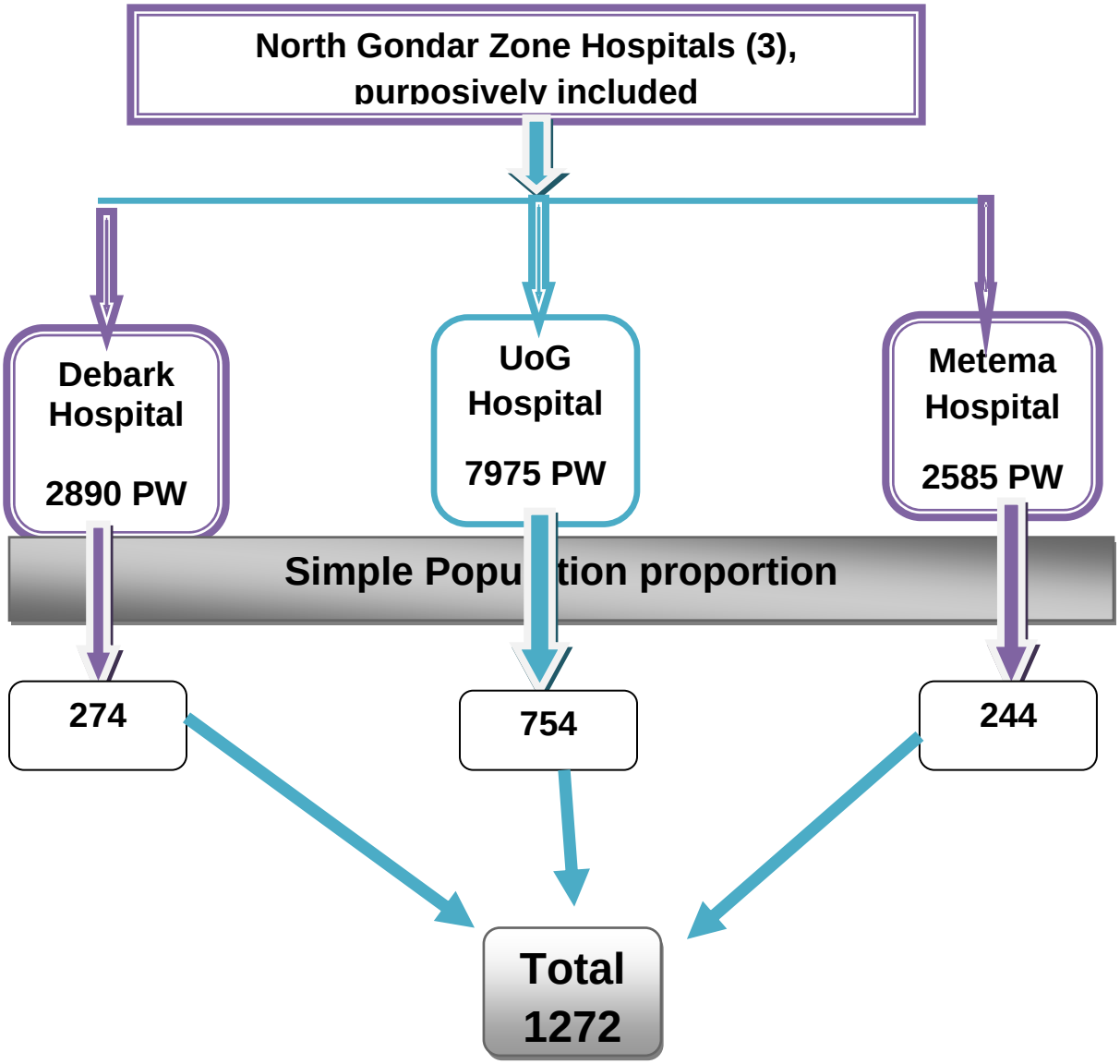

Figure 2: Schematic presentation of sampling procedures on prevalence of Smear positive TB and associated factors among pregnant women Northwest Ethiopia, 2014.

3.9 Variables

Dependant variable

- Prevalence of Tuberculosis

Independent variable

- Socio demographic characteristics:
  - Age, marital status, educational status, religion, occupation
- Socio economic and environmental factor
  - Residence
  - Family history of TB
  - Biomass fuel use
  - Crowding, poor ventilation
  - Family size
- Behavioral factor
  - alcohol consumption,
  - smocking
- Clinical diseases
  - HIV
  - Diabetics
  - Malnutrition

3.10 Operational definition

Women at ANC: pregnant women who visit antenatal care clinic at list once during the study period.

Smear positive tuberculosis/PTB: When subjects with two sputum smear-positive results for AFB/LED Fluorescent microscope or one positive smear result for AFB/LED in the case of HIV positive subjects.

TB suspects: is any person with symptoms and signs suggestive of TB in particular cough of two weeks or more duration.

3.11 Design and Data collection procedure

Institution based cross sectional study was conducted to estimate the prevalence of smear-positive tuberculosis and to find out factors associated with prevalence of TB among women s' attending their antenatal care in all hospitals of North Gondar Zone.

Those Hospitals were taken considering different climate and way of living conditions. Systemic random sampling technique were employed to select Pregnant women who came to attend their ANC service to each health institution for interview and then women who had cough for at least two weeks and able to produce sputum were selected/send for further laboratory smear identification.

A total of 15 health professionals (6 nurses in ANC clinic, 6 laboratory technologists and 3 supervisors) were recruited and trained for data collection on screening of pulmonary tuberculosis by asking persistence cough and cardinal symptom, inclusion criteria, sputum collection, how to treat pregnant women and produce sputum and record keeping. Each data collector handled all pregnant women coming to attend their ANC in the given hospital during data collection period interviewed every 2^{nd} pregnant women using a pretested and structured symptom screening questioner. After obtaining written informed consent, demographic, socio-economic and other illness history (cough for more than two weeks, shortness of breath, night sweet, and chest pain e.t.c) were collected for each study subjects. ANC nurses link those pregnant women who had cough of at list two weeks to the laboratory technologists and the laboratory

technologists were collect three sputum samples,(spot morning spot) for each TB suspected pregnant women using a labeled sputum container. The first sputum sample was collected during the interview day and the second early in the following day by consulting them to produce and collect sputum before they eat or drink and the third sample was collected while they bring the morning sample. Data collectors traced actively suspected individuals who did not provide samples. Reason for not providing the sample were recorded on the questionnaire (not able to produce, not willing to produce sputum, not present and others).

Sputum smear microscopy

Sputum-smear microscopy using a light emitted diode (LED) fluorescence microscopy was done in both hospitals on the day of collection following the manufacturer's procedures (PARTEC GmbH) [31]. Three slides were stained for every individual and the slides were read by two experienced laboratory technologists separately.

Data quality control

Training was given to the data collector, nurses and laboratory technologists and supervisors on the objective, relevance of the study, informed consent and techniques of interview, inclusion exclusion criteria, sampling technique e.t.c. Before going to data collection, The English version questionnaire was translated in to Amharic and then back to English to maintain its consistency, a pre-test was conducted on 5% pregnant women at ANC in other Gondar health center to ensure the validity of the questionnaire. The collected data was checked for completeness and consistency by the supervisors, on daily basis by the principal investigator. Appropriate correction was made to the data collectors for any error or ambiguity and incompleteness in the following days before preceding the next day activities. Efforts were made to ensure a high quality of sputum by appropriate orientation of participants on how to produce sputum from lung and to produce at least 3 ml of sputum and supervision will be made by laboratory workers. Poor specimens were replaced with an immediate spot collection. The sputum sample was prepared on slide immediately as soon as possible for each participant at the day of collection and samples were preserved for discordant results and for further

confirmation. The slides were read by two experienced laboratory technologists separately. All laboratory investigators followed accepted standard operating procedures (SOPs). For discordant results, a third expert senior laboratory technologist prepares and read the slides the third reader report was taken as final. Repeated examinations were done for pregnant women with one positive smear and one negative smear. All positive samples and 10% of negative samples were re-examined by senior laboratory technologists at the University of Gondar Teaching Hospital Laboratory. All smear-positive cases identified during the study period were treated according to the national guidelines.

4. Data management and analysis

Data entry and cleaning carried out using the Epi Info version 3.5 statistical software, were analyzed on SPSS software package version 20.0 (SPSS, Inc., Chicago, IL, USA). Descriptive statistics, such as frequency distribution, mean percentage and standard deviation were employed for most variables. Tables and graphs were also used for data presentation. Binary logistic regression was used to identify factors associated with smear-positive tuberculosis. Multiple logistic regression Model was fitted to control the possible effect of confounders and finally the variables which had independent association with TB were identified on the basis of OR, with 95%CI and p-value less than 0.05. The variables were entered to the multivariate model using the forward stepwise (Likelihood ratio) regression model. Model fitness was checked using Hosmer and Lemeshow goodness of a fit test (0.894).

5. Ethical Consideration

The study protocol was reviewed and approved by Institutional Review Board of the University through Institute of Public Health of Collage of Medicine and Health Science. Hospital managers (administrative) of the hospitals in the study areas were consulted and permission obtained prior to data collection. Written informed consent was obtained from each study subjects. The purpose and benefits of the study was explained to the respondents. Confidentiality of the information was maintained throughout by excluding

names as identification in the questionnaire and keeping their privacy during the interview by interviewing them alone.

6. Dissemination of findings

The results of the study will be submitted to district hospitals, University of Gondar Research and Community Service Process Office, Regional health Bureau and Federal Ministry of Health. The results will be disseminated to Ethiopian Public Health Association and other interested governmental and Non-governmental organizations. This paper will be published in peer-reviewed scientific journal. Public outreach activities for realizing research findings, for example through conference, will also be important avenue for dissemination

7. Results

There were a total of 1272 pregnant women aged ≥18 years screened for tuberculosis through a symptom interview questioner. The mean standardization age of respondents was 27.5 (±SD 5.2) years ranging from 18-43 years. About 37.4% of respondents had no formal schooling. As to residence, about 930(73.1) and 342(26.9) live in urban and rural respectively.

Table 1: Socio Demographic Characteristics of Pregnant Women in Northwest Ethiopia, 2014 (n=1272)

Variables	Number	Percent
Age		
18-25	478	37.6
26-35	682	53.6
>36	112	8.8
Educational level		
No formal education	476	37.4
Primary education	216	17.0
Secondary education	303	23.8
Tertiary education	277	21.8
Marital status		
Single	52	4.1
Married	1184	93.1
Divorced	31	2.4
Widowed	5	0.4
Occupation		
House wife	705	55.4
Privet work	326	25.7
Government Employee	241	18.9
Residence		
Urban	930	73.1
Rural	342	26.9

Duration of cough

Majority of smear-positive pregnant women reported a cough of more than two weeks, which indicates delay in diagnosis.

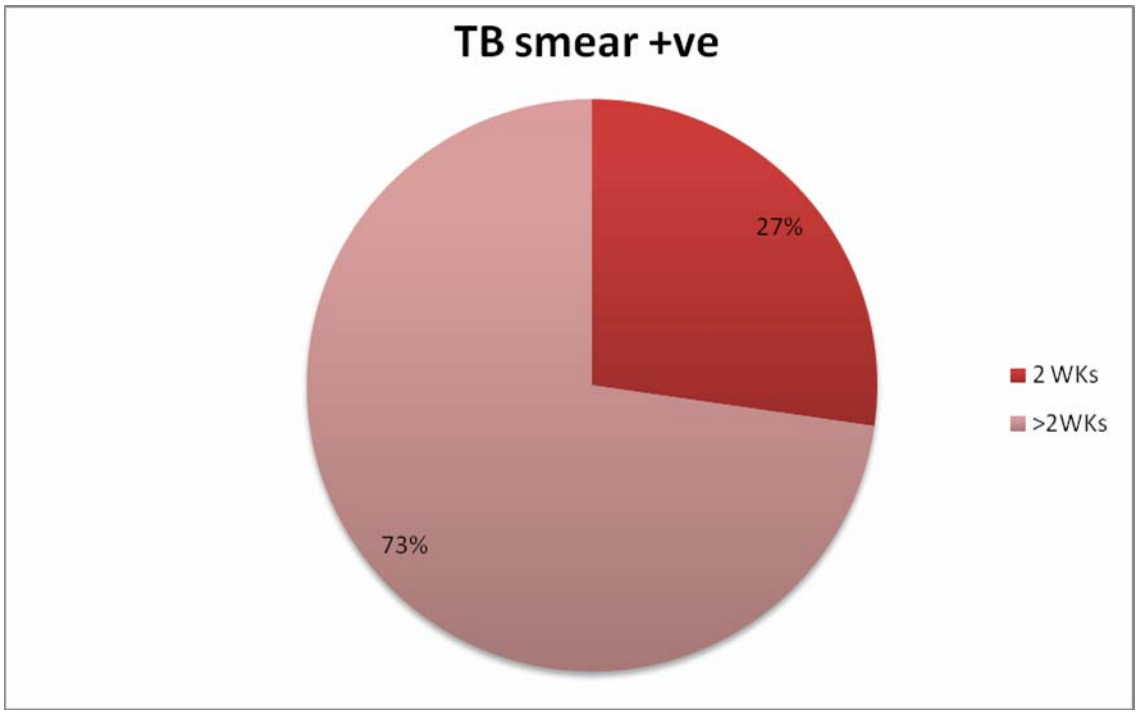

Figure 3: cough duration and smear positivity of pregnant women North Gondar Zone hospitals, 2014

Symptom screening

Screening of tuberculosis during pregnancy using cardinal signs is often difficult because of non specific symptoms of pregnancy which may overlap with tuberculosis.

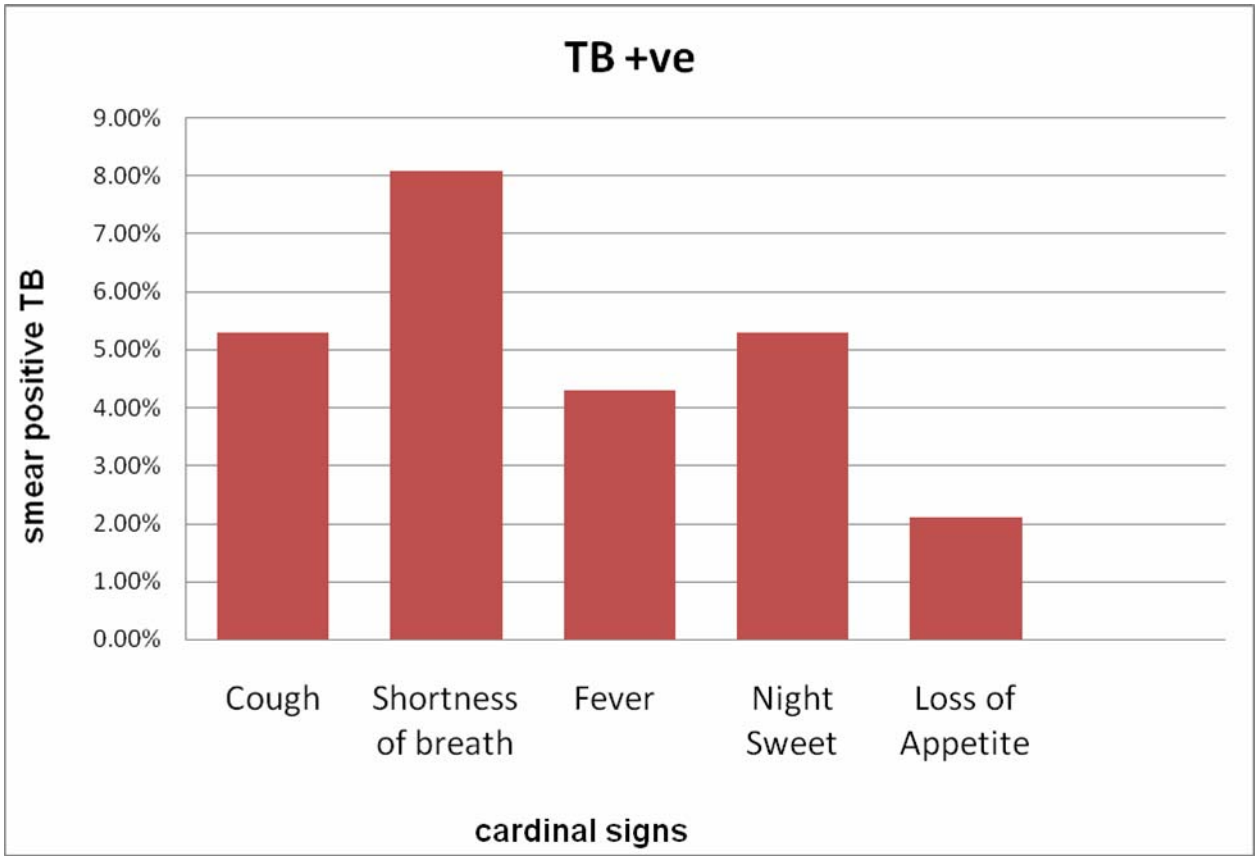

Figure 4: Screening smear positive TB among pregnant women using cardinal signs in North Gondar Zone, Northwest Ethiopia, 2014

7.1 Prevalence of smear positive Tuberculosis

From 207 individuals who reported cough, 11 (5.3%) were smear- positive. Thus, the prevalence of smear- positive TB was 864per100,000 in persons ≥18 years (95% CI: 401-1122).

7.2 Factors associated with smear positive tuberculosis

Higher rates of smear positivity were observed among HIV positive [AOR: 7.24; 95% CI (2.01-26.03)], and rural residence [AOR: 5.5; 95% CI: (1.398-22.068)] (Table 2).

In the Bivariate analysis, family size, diabetics, residence, HIV infection, previous exposure and family contact of tuberculosis were associated with smear-positive tuberculosis in pregnant women

However rural residence, HIV infection family history of tuberculosis was significantly associated with smear-positive tuberculosis after the multivariate logistic regression analysis after controlling effect of confounding.

Higher rates of smear-positivity were observed among pregnant women with family history of TB [AOR: 55.78; 95% CI: (12.373 -251.536)].

Furthermore respondents from rural area were 5.5 times more likely to have smear-positive TB than women from urban residence [AOR: 5.5, 95% CI: (1.398-22.068)].

The study also showed statistically significant association between smear-positive tuberculosis and HIV infected pregnant women. Women who were HIV positive were 7.24 times more likely to have smear-positive tuberculosis as compared to those HIV uninfected one [AOR: 7.24, 95% CI (2.01-26.03)].

Table 2: prevalence of smear-positive TB detected by selected socio-demographic Environmental and Clinical factors of pregnant women in North Gondar Zone Hospitals, Northwest Ethiopia, 2014 (n=1272)

Variables	Positive for FM		Crud OR (95%) CI	Adjusted OR (95%)
	Yes	No		
Family size				
≥5	8	325	7.68(2.025-29.122)	
1-4	3	936	1	
Diabetics				
Positive	1	11	11.364(1.338-96.54)	
Negative	10	1250	1	
Residence				
Rural	6	336	3.304(1.002-10.896)	5.55(1.398-22.068)*
Urban	5	925	1	
Family history TB				
Yes	5	19	54.474(15.29-194.04)	55.78(12.37-251.53)*
No	6	1242	1	
HIV				
Positive	4	108	6.101(1.758-21.170)	7.24(2.01-26.03)*
Negative	7	1153	1	

*statically significant variable for tuberculosis which *P-value* < 0.05

8. Discussion

This finding revealed that prevalence of smear positive tuberculosis among pregnant women was 864 per 100,000 populations.

The measured prevalence is almost equivalent to an active tuberculosis case finding among pregnant women presenting to ANC in Soweto, South Africa which is 889per 100,000 populations[23], this may be due to the higher prevalence of HIV in these two settings.

However the result was smaller than a study in Tanzania, Dar Es Salaam 3.8% and South Africa 3.3% [9, 28] which may be due to the study area, Dar Es Salaam has a high tuberculosis burden in the region and they enroll only women with cough attending in the clinic and South Africa majority of pregnant women were HIV positive and the method that they used to diagnose, smear preparation plus culture was employed in the study.

While lower prevalence were reported from pregnant women in Malawi[10] which was 384 per 100,000 populations this may be due to study design they were used, (prospective) and using only one district hospital which may not represent all pregnant women and may be a good TB control strategy and low tuberculosis in the general population, that is Malawi is not found among the 22 high burden country (2).

Different reports indicating that women in developing countries develop tuberculosis during their reproductive (15-44) age[11] and antenatal care is a good opportunity to access pregnant women. Even if there was no study in Ethiopia which indicates prevalence of TB among pregnant women this study shows relatively high prevalence. This may be due to including pregnant women on DOTs which revealed smear positivity during the study period. The current study also trying to address pregnant women from different climatic, socio-economic and environmental conditions that contribute for tuberculosis progression in pregnant women Metema woreda which is highly HIV prevalent in the region, Debark woreda practicing substantial farming in which pregnant women may be exposed for poor nutritional status. And the overall prevalence of HIV in

pregnant women was 8.6% which mimics the progression and reactivation of TB in pregnant women. Plus the method we were used, LED Fluorescent Microscope which had high sensitivity than AFB and ANC nurses and laboratory technologists are well experienced to screen those pregnant women and made their effort for diagnosis.

This high prevalence of TB in pregnant women could pose problems to TB control in the children, their family and in the general population as tuberculosis can transmit vertically and horizontally to their babies and children, their family respectively.

This study showed that family history of TB has a significant association with tuberculosis positivity during pregnancy. Family history of tuberculosis especially in rural areas is more likely to develop active tuberculosis. This finding is in line with the Guide Line for TB/HIV and Leprosy, the individual lives in close contact with smear positive pulmonary tuberculosis are more likely to develop TB [29].

A study done in Northwest Ethiopia, Tanzania and Kenya [21,28,30], reported high association between pulmonary TB with family history and contact with other tuberculosis infected persons. This may be due to women who had contact with their families or other infected persons may develop active tuberculosis while they become pregnant.

HIV increases susceptibility to infection with *M. tuberculosis*, the risk of progression to TB disease, and the incidence and prevalence of TB [31]. The life time risk of HIV positive individuals to develop TB is 20-37 times greater than HIV negative individuals. It also increases the likelihood of re-infections and relapses of TB [29]. In a population where TB/HIV is common, health services struggle to cope with the large and rising number of TB. HIV/AIDS has a number of impacts on TB patients and the control programs [31].

In this cross sectional study, women with HIV Sero positive were 7.24 times higher probability of smear-positivity than HIV uninfected pregnant women [AOR= 7.24; 95% CI: (2.01-26.03)]. This finding is in agreement with studies in Malawi, South Africa and Tanzania [10,28,32] respectively explained that HIV Sero positive pregnant women had

higher prevalence of smear-positive tuberculosis infection as compared to HIV uninfected pregnant women. The association in this study might be due to possible reasons, HIV induced immune suppression and HIV increases risk of re activation of latent tuberculosis. On the other hand a study in Kenya [30] states that smear positive tuberculosis were not associated with HIV infection, this may be due to participants in the study were with high level of immune suppression or very low CD4 count which may yielding a negative smear microscopy.

This study was also had a discrepancy in the rural to urban distribution of PTB. The associations between smear-positive PTB among pregnant women who lives in the rural areas are more prevalent. Pregnant women from rural areas are greater than five times more likely to be infected with tuberculosis than women from urban [AOR= 5.55; 95% CI: (1.398-22.068)], in line with this a study two studies in Northwest Ethiopia and a study in Rajesh city of Bangladesh [7, 33, 34] report this association. This may be due to poor housing condition, family size living in one room/cell, poor socio economic status, poor income/nutritional status and may be lack of knowledge about transmission, tuberculosis screening behavior and others, in which most of cases that we found in rural areas are associated with family contact history of tuberculosis and others.

Age have been associated factor in other studies [7, 21] were increase in age significantly associated with tuberculosis which may be due to the risk of TB acquisition progression and reactivation increases as age increases. But in this study age is not found to be associated with smear positive tuberculosis in pregnant women. This may be due to study subjects found to be almost in the same range that is the mean age 27.5 with (±SD 5.2) younger than the mean age of the above community based studies.

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9. Limitation of the study

A gold standard for tuberculosis diagnosis (culture) was not employed, and we were not collected data on antiretroviral use among HIV positive pregnant women.

Comparison with other study findings was done under some limitation, and even though there were a try to capture adequate sample size still it was insufficient resulting in wide confidence interval (CI). However we are trying to incorporate all pregnant women who had cough for at least two weeks during the study period and capture sputum sample, and laboratory tests were done by experienced persons and those who train to use LED microscope.

10. Conclusion

The prevalence of smear positive tuberculosis was high among pregnant women. Being in rural residence, HIV infection, and having a family history of tuberculosis were factors associated with TB in pregnant women.

11. Recommendation

1. Programmatic

- ✓ Ministry of Health in collaboration with TB program should promote/ focus on tuberculosis screening in pregnant women, especially HIV positive pregnant women,
- ✓ Regional Health Bureau and National tuberculosis control programs are urgently required to develop locally appropriate interventions for early diagnosis of tuberculosis in pregnant women
- ✓ Should develop a screening program for every ANC service providers of health institutions
- ✓ Should strength sustainable health education using locally appropriate materials and screening program for pregnant women during their follow up
- ✓ Strengthening collaboration of TB/HIV department and ANC clinics. Referral hospitals like University of Gondar Hospital by now doing Gene Expert, which is more sensitive than other methods for HIV patients and children under five, considering the burden the program should include pregnant women who had cough at list two week and suspected one.

2. For health care providers

- ✓ They should conduct TB screening in ANC clinics effectively other than cardinal signs

3. For researchers

- ✓ Further research and investigation is needed to understand burden of TB in women of reproductive age by developing different methods for pregnant women other than cardinal signs.

4. To pregnant women

- ✓ Should screen for tuberculosis as soon as possible when they fell cough of more than two weeks and other cardinal signs.

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13. Annexes

Questionnaire for the assessment of Prevalence of Smear positive Tuberculosis and associated factors in Pregnant Women attending ANC in North Gondar Zone Hospitals.

Consent Statement

Nice to meet you. My name is _____and I am a data collector for the research to be conducted by a team of researcher from university of Gondar. We are collecting information on factors contributing to tuberculosis infection among pregnant women atending ANC service in the hospital. We would very much appreciate your participation in this effort. Whatever information you provide will be kept strictly confidential. We will record your name on the questionnaire. However, your name will not be identified in any output of this study. Participation in this study is voluntary and you can choose not to answer any individual question or all of the questions. You may also stop the interview completely at any time without any consequences at all. However, we hope that you will participate in this study since the reults will help to develop strategies for government in tuberculosis control effors. You have full right to withdraw from this study at any time without a need to mention the reason why you wanted to withdraw. We value your input to make this study a successful one.

You will not get or provided intensive or payments that you are participating in the study rather it is full of voluntary as I mentioned before. At this time, do you want to participate in the study? If you have questions about the research please contact:- Adugna Berju who is principal investigator of this study in the University of Gondar, at +251(0)918212151 or Dr. Takele Tadesse at +251(0)918773317. At this time , do you want to ask me anything about the purpose or content of this interview?

1. Yes 2. No

If the response is “Yes”, procide to the next page.

If the response is “No”, thank the respondent and stop there.

Questionnaire ID ☐☐☐

Part 1:- General information

Socio demographic and economic condition

No	Question	Response	Remark
101	ID No	☐☐☐☐☐	
102	Age/years	☐☐	
103	Ethnicity	Amhara ……1 Oromo ……..2 Tigiry ……3 Others ……..4	
104	Religion	Orthodox ……..1 Muslim ……....2 Catholic ……...3 Protestant ……4	
105	Educational status	No school …….....1 Read and write ……. ……...2 Primary school ……....3 Secondary school……4 Above secondary school……..5	
106	Marital status	Single ……..1 Married …….....2 Divorced ……..3 Widowed ……4	

No	Question	Response	Remark
107	Occupational status	Peasant ……..1 student …….....2 Daily labor …….....3 Civil servant…….……4 NGO……..……5 Privet business ……6 House wife……7	
108	Residence	Urban ……1 Rural ……...2	

Part 2 □ - Current illness and Duration

No	Question	Response	Remark
201	Did you experience cough for two weeks or More?	Yes ……..1 No …….. 2	**If no, 203**
202	If you say" yes"for Q. No.201 how long have it been since your current symptom starts?	In days ☐☐	
203	Do you have of sputum?	Yes……...1 No ……2	
204	If yes for to203, for how long?	In days ☐☐	
205	Do you have blood in sputum?	Yes……...1 No ……2	
206	If yes to205, for how long?	In days ☐☐	
207	Do you have fever?	Yes ……..1 No ……2	

No	Question	Response	Remark
208	Did you have night sweet?	Yes ……...1 No …….2	
209	If yes to208, for how long?	In days ☐☐	
210	Do you have loss of appetite?	Yes……..1 No ……...2	
211	If your answer is yes for Q No 208, for how many days?	In days ☐☐	
212	Did you have weight loss?	Yes…….1 No ……..2	
213	Do you have LN swelling?	Yes ……1 No……...2	
214	Did you have chest pain?	Yes…….1 No ……..2	
215	If yes to214, for how long?	In days ☐☐	
216	Did you have shortness of breath?	Yes…….1 No ……..2	
217	If “yes” to 216, for how long?	In days ☐☐	
218	Do you give sputum samples for Lab?	Yes……1 No …….2	
219	Reason for not providing sputum sample	Not able to produce sputum……..1 Not willing to produce sputum…….2 Not present ……3 Other(specify)……4	
220	Smear result for those who provide sputum	Positive……1 Negative ……2	

Part 3:-Environmental and Behavioral factors

No	Question	Answer	Remark
301	Number of people in house hold	In No. ☐☐	
302	Number of room	In No. ☐☐	
303	Person per room	In No. ☐☐	
304	Family history of TB	None ……1 One……2 More than one……..3	
305	Wall construction material	Wood with mud……1 Cement/ blocks……...2 Wood only……3	
306	Floor type	Mud /soil……..1 Cement……2 Wood……3	
307	Window	☐☐	
308	Do you have separate kitchen	Yes……1 No 2	
309	Do you have animals	Yes……1 No ……...2	
310	Do your animals share your house	Yes……..1 No……2	
311	Type of house you are living in	Wood, mud and crop residence ……..1 Wood, mud and stainless still……...2	

No	Question	Answer	Remark
		Stone/brocket, and SS…….3 Others……..4	
313	Main type of light source at home	Electric…….....1 Gas ……2 Wood……..3 Battery /hand ……4 Others ……5	
314	What is the main source of fuel for cooking at home?	Wood……1 Plant residue ……...2 Animal dung…….3 Electric ……..4 Charcoal ……...5 Gas ……6 Others……..7	
315	Do you drink alcohol	Yes……1 No……...2	
316	If your answer is “yes” for Q No 315, for how long period of time? /if it is less than one year pleas register “00”	**Years** | | |	
317	History of smoking	Yes I have smock…….1 Husband……2 Family member…….3 Work place…….4 There is no any smoke around me……5	

Part 4 Other clinical diseases history

No	Question	Answer	Remark
401	Do you have a problem of diabetics?	Yes ……1 No ……...2	
402	What is your HIV status	Positive……...1 Negative…….2 Un known……..3	
403	Height in cm		
404	Weight in kg		
405	MUAC cm		

Thank you very much for taking time and providing valuable information

Interviewer Name_____**signature**_____**Data**_____

TB suspect and Laboratory Register for PTB cases

Sr. No.	Individual ID	Sputum specimen		Smear result		Date	Remark
				1.positive	2.negative		
1		SP1		SP1			
		SP2		SP2			
		SP3		SP3			
2		SP1		SP1			
		SP2		SP2			
		SP3		SP3			
3		SP1		SP1			
		SP2		SP2			
		SP3		SP3			
4		SP1		SP1			
		SP2		SP2			
		SP3		SP3			
5		SP1		SP1			
		SP2		SP2			
		SP3		SP3			
6		SP1		SP1			
		SP2		SP2			
		SP3		SP3			
7		SP1		SP1			
		SP2		SP2			
		SP3		SP3			
8		SP1		SP1			
		SP2		SP2			
		SP3		SP3			

Name of Lab. Technologist_____ Signature _____ Date_____

Smear results for further Laboratory confirmation (quality control)

Sr. No	Individual ID	Smear result 1.positive 2.negative		Remark
1		SP1		
		SP2		
		SP3		
2		SP1		
		SP2		
		SP3		
3		SP1		
		SP2		
		SP3		
4		SP1		
		SP2		
		SP3		
5		SP1		
		SP2		
		SP3		

Reported by confirmed by (senior Lab.Tec)

Name _____ Name_____

Signature _____ Signature_____

Date _____ Date _____

AMHARIC VERSION QUESTIONNAIRE

በጎንደር ዩኒቨርሲቲ የህክምናና ጤና ሳይንስ ኮሌጅ

የማህበለሰብ ጤና ሳይንስ የድህረ ምረቃ ትምህርት ክፍል መረጃ መስጫ ቅፅ

ይህ መጠይቅ የወሊድ ክትትል የሚያደርጉ እናቶች የ ቲ.ቢ ሁኔታቸዉንና ተጓዳኝ ሁኔታወችን ለማጥናት የተዘጋጀ የዳሰሳ መጠይቅ ነዉ፡፡

የስምምነት ቃል

ጤና ይስጥልኝ፡፡ ስሜ_____ነው::

በጎንደር ዩኒቨርሲቲ በመጡ የጥናት ቡድኖች አባላት የመረጃ ሰብሳቢ ነኝ፡፡ በአካባቢው በነፍሰጡር እናቶች የቲቢ በሽታ ሁኔታን ለመዳሰስ ወሳኝ የሆኑ መነሻዎችን ለማጥናት መርጃ በመሰብሰብ ላይ እንገኛለን፡፡ የሚሰጡት መረጃ በሙሉ በከፍተኛ ምስጢር የሚያዝ ነው፡፡ ስምዎን በመጠየቁ ላይ እንመዘግባለን፡፡ ነገር ግን ስምዎ ከማንኛውም ከዚህ ጥናት ውጤት ጋር እይያያዝም፡፡ በዚህ ጥናት ውስጥ የሚያደርጉት ተሳትፎ በፈቃደኝነት ላይ የተመሰረተ ስለሆነ ከጥያቄዎች አንዱን ወይም ከዚያ በላይ ላለመመለስ መወሰን ይችላሉ፡፡ በፈለገዎ ጊዜ ቃለ-ምልልሱን በሙሉ ቢያቋርጡ እንኳ የሚደርስብዎ ነገር አይኖርም፡፡ ከዚህ ጥናት የሚገኘው ውጤት መንግስት የቲቢ በሽታን ለመቆጣጠር ለሚያደርገው ጥረት የሚረዳ ነው፡፡ በዚህ ጥናት ለመሳተፍ ፈቃደኛ ባይሆኑ የቲቪም ሆነ ሌላ በሽታ ህክምና ማግኘት የሚችሉ መሆንዎንና ምንም አይነት ጥቅምም ሆነ እርዳታ እንደማይቀርብለዎ ላስታውቀዎ እወዳለሁ፡፡

ጥያቄውን ተቀብሎ ለመመለስ ተስማምተዋል _____

ጥያቄውን አልተቀበለም _____

ክፍል 1: የመላሾች ዲሞግራፊያዊ፡ ኢኮኖሚያዊ ና ማህበራዊ ሁኔታን በሚመለከት

ተ.ቁ	ጥያቄ	መልስ	ምርመራ
101	የመለያ ቁጥር	.....	
101	እድሜ /በዓመት/	.....	
102	ብሔር	አማራ_____1 ኦሮሞ_____2 ትግሬ_____3 ሌላ_____4	
103	ሃይማኖት	ኦርቶዶክስ _____ 1 እስላም _____ 2 ኘሮቴስታንት _____ 3 ካቶሊክ _____4	
104	የትምህርት ሁኔታ	ያልተማር_____1 ማንበብና መፃፍ የሚች-----2 1ኛ ደረጃ _____3 2ኛ ደረጃ _____4 ከ2ኛ ደረጃ በላይ _____5	
105	የጋብቻ ሁኔታ	ያላገባ/ች ----------1 ያገባ/ች ----------2 የተፋታ/ች ----------3 የሞተበት/ባት ----------4	
106	የሥራ ሁኔታ	ኣርሶኣደር ----------1 ተማሪ ……..…….2 የቀን ሰራተኛ……3 የመንግስት ሰራተኛ……....4 NGO…….....5 የግል ስራ……6 የቤት እመቤት……..7	
107	መኖሪያ	ከተማ ---------- 1 ገጠር ----------2	

ክፍል 2 የወቅቱን ህመምና የቆበትን ጊዜ በሚመለከት

ተ.ቁ	ጥያቄ	መልስ	ምርመራ
201	ሁለት ሳምንትና ከዚያ በላይ የቆየ ሳል አለብዎት?	አወን ----------1 የለም ----------2	መልሱ የለም ከሆነ፣ ወደ ጥ. ቁ 205
202	ለጥያቄ ቁጥር 201 የሰጡት መልስ "አዎ" ከሆነ ይህ ምልክት ከጀመረ ምን ያህል ጊዜ ሆነው?	በቀናት	
203	አክታ አለብዎት?	አወን ----------1 የለም ----------2	
204	መልስዎ አዎ ከሆነ፤ ለምን ያህል ጊዜ?	በቀናት	
205	አክታው ደም አለበት?	አወን ----------1 የለም ----------2	
206	መልስዎ አዎ ከሆነ፤ ለምን ያህል ጊዜ?	በቀናት	
207	ትኩሳት አለብዎት?	አወን ----------1 የለም ----------2	
208	የሌሊት ላበት አለብዎት?	አወን ----------1 የለም ----------2	
209	ለጥያቄ ቁጥር 208 የሰጡት መልስ "አዎ" ከሆነ ለምን ያህል ጊዜ?	በቀናት	
210	የምግብ ፍላጎት መጥፋት?	አወን ----------1 የለም ----------2	
211	ለጥያቄ ቁጥር 210 የሰጡት መልስ "አዎ" ከሆነ ለምን ያህል ጊዜ?	በቀናት	

ተ.ቁ	ጥያቄ	መልስ	ምርመራ
212	ክብደትዎ ቀንሷል?	አወን ----------1 የለም ----------2	
213	የእጢ እብጠት /የመገጣጠሚያ/ አለዎት?	አወን ----------1 የለም ----------2	
214	የደረት ህመም አለብዎት ?	አወን ----------1 የለም ----------2	
215	መልስዎ አዎ ከሆነ፤ ለምን ያህል ጊዜ?	በቀናት	
216	የትንፋሽ ማጠር አለብዎት?	አወን ----------1 የለም ----------2	
217	ለጥያቄ ቁጥር 216 የሰጡት መልስ “አዎ” ከሆነ ለምን ያህል ጊዜ?	በቀናት	
218	ለጥያቄ ቁጥር 217 የሰጡት መልስ “አዎ” ከሆነ የአክታ ናሙና ለምርመራ ይሰጣሉን?	አወን ----------1 የለም ----------2	
219	ለጥያቄ ቁጥር 218 የሰጡት መልስ “አዎ” ከሆነ አክታ የተወሰደበት /ቀን /ወርና/ ዓመት	ወዲያዉኑ ቀን ወር ዓ/ም ጧት ወዲያዉኑ	
220	ለጥያቄ ቁጥር 219 የሰጡት መልስ የለም ከሆነ ናሙና ያልሰጡበት ምክንያት ምንድነው?	አክታ ለማውጣት መቸገር-----1 አክታ ለመስጠት ፍቃደኛ አለመሆን------2 አልነበረም/ አልነበረችም--------3 ሌላ ካለ ይገለፅ ----------4	
219	የአክታ ምርመራ ውጤት	ፖዝቲቭ ----------1 ኔጌቲቭ ----------..2	

ክፍል 3 አካባቢያዊ እና ባህሪያዊ ምክንያቶቸችን በተመለከተ

ተ.ቁ	ጥያቄ	መልስ	ምርመራ
301	የቤተሰብ ብዛት	☐☐	
302	የክፍሎች ብዛት	☐☐	
303	በአንድ ክፍል የተጠቃሚ ብዛት	☐☐	
304	የቤተሰብ በቲቪ በሽታ የሳንባ ነቀርሳ ታሪክ	ምንም……..1 አንድ አባል……..2 ከአንድ በላይ…….3	
305	ግድግዳዎች	እንጨት በጭቃ----------1 ሲሚንቶ ----------2 እንጨት ----------3	
306	ወለል	ጭቃ ----------1 ሲሚንቶ ----------2 እንጨት ----------3	
307	የመስኮት ብዛት	☐☐	
308	የተለየ ወጥ ቤት አለዎት?	አወ ……..…1 የለም…….2	
309	እንሰሳት ከሰዎች ጋር ይኖራሉ?	አዎ……...1 የለም …….2	
310	የመኖሪያ ቤትዎ ምን አይነት ነው?	እንጨት ጭቃና ሳ……...1 እንጨት ጭቃና ቆርቆሮ…….2 ከድንጋይ /ብሎኬት ቆርቆሮ……3 ሌላ ከሆነ ይገለ……..4	
311	ለቤት መብራት ለማግኘት በብዛት የምትጠቀመበት ምንድነው?	ኮረንቲ ----------1 ፋኖስ ----------2 ኩራዝ ----------4 የእጅ ባትሪ ---------- 5	

ተ.ቁ	ጥያቄ	መልስ	ምርመራ
		የማገዶ እንጨት ---------- -6 ሌላ ከሆነ ይገለፅ ------- 7	
313	መጠጥ ይጠጣሉ?	አወን ----------1 የለም ----------2	
314	ለጥያቄ 316 የሰጡት መልስ “አዎ” ከሆነ ለምን ያህል ጊዜ ሲጠጡ ነበር? /ከአንድ ዓመት በታች/ያነሰ ከሆነ “00” ይመዝግቡ	ዓመታት ☐☐	

ክፍል 4:ተጓዳኝ ህመሞችን በተመለከተ፡-

ተ.ቁ	ጥያቄ	መልስ	ምርመራ
401	የስኳር በሽታ አለብወ?	አወን ----------1 የለም ----------2	
402	የኤች አይቪ ሁኔታ	1.ፖዝቲቭ 2. ኔጌቲቭ 3. አይታወቅም	
403	ቁመት በሴ.ሜ		
404	ክብደት በኪ.ግ		
405	MUAC በሴ.ሜ		

የስራ ጊዜዎን ሰውተው ስለሰጡን እጅግ ጠቃሚ መረጃ በጣም አመሰግናለሁ::

የቃለ- ምልልስ አቅራቢ ፊርማ_____ ቀን _____

Annex 1: information sheet and consent form

- **Title of the research project**

Prevalence of smear positive tuberculosis and associated factors among pregnant women attending ANC in North Gondar Zone hospitals. Institution based cross sectional study.

- **Name of investigator**: Adugna Berju (DVM)
- **Name of the Advisors**:
  1. Dr.Takele Tadesse (PHD, Associate proffesor)
  2. Dr Sileshi Nigatu (DVM, VPH)
- **Name of the organization :** university of Gondar College of medicine and health science, school of public health
- **Name of sponsor :** university of Gondar

Introduction

This information sheet and consent form is prepared with the aim of explaining the research project that you are asked to join by the group of research team. The main aim of this research project is to determine the prevalence of smear positive tuberculosis and associated factors among pregnant women attending ANC in North Gondar Zone Hospitals.

This research team includes one principal investigator, three nurses as data collector, three laboratory technician, three supervisors and two advisors from University of Gondar.

Purpose:

The purpose of this research study is there for to determine the prevalence of smear positive tuberculosis and associated factors among pregnant women attending ANC in North Gondar Zone Hospitals, North west Ethiopia. The information that you will provide us will help us to determine the prevalence, and identify main factors which contribute to

TB in pregnant women. The result of this study used to improve TB prevention and control program in pregnant women in the study area in particular and in Ethiopia in general through early detection of TB which decreases maternal and child mortality.

Procedures

If you agree to participate in this study, you kindly requested to give us the correct information about yourself add the study participant for this study are pregnant women attending ANC in all Hospitals of North Gondar Zone.

Potential risks and discomfort of being in the study

By participating in this research project, you may have some discomfort. There are no or minimal anticipated risk but taking time about 1 hour for interview.

Benefits of being in the study

There may not be direct benefits to you for giving us information for the study.

Confidentiality and Privacy Protections:

The records of this study will be stored securely and kept confidential. All publications will exclude any information that will make it possible to identify you as a subject.

Person to contact

If in case anyone wanted to know more information about the research and related issues, he/she could contact responsible bodies of the research through the following addresses.

1. Adugna Berju (DVM): principal investigator
   Cell phone +251(0) 918212151

   E-mail: adushet@gmail.com

2. Dr. Takele Tadesse, University of Gondar College of medicine and health Sci.
   Cell phone: +251(0)918773317

E-mail

3. Dr. Seleshe Nigatu,
   Cell phone……..

   E-mail ……..

Name of study participant:_____Signature_____Date:_____

Name of witness_____Signature:_____Date_____

Name of investigator/representative/:_____Signature_____Date_____

በጎንደር ዩኒቨርሲቲ የህክምናና ጤና ሳይንስ ኮሌጅ

የማህበረሰብ ጤና ሳይንስ የድህረ ምረቃ ትምህርት ክፍል

የጥናቱ ማብራሪያ እና የስምምነት ማረጋገጫ ፎርም

ይህ የኢንፎርሜሽን መስጫና የስምምነት ማረጋገጫ ፎርም የተዘጋጀዉ የጥናቱ ተሳታፊዎች ስለሚካሄደዉ ጥናት ግንዛቤ ኑሮአቸዉ የበኩላቸዉን አስተዋፅኦ እንዲያደርጉ ነዉ፡፡
ጥናቱ የሚካሄደዉ በስሜን ምዕራብ ኢትዬጲያ ሰሜን ጎንደር ዞን በሚገኙ ሆስፒታሎች ሲሆን የጥናቱ ዋና አላማ የእርግዝና ክትትል የሚያደርጉ ነፍሰጡር እናቶች የ ቲ.ቢ ሁኔታ እና አስተዋፀኦ የሚያደርጉ መንስኤዎችን ለመለየት ነዉ፡፡

የጥናቱ ቡድኖች የሚከተሉት ናቸዉ

1. ዶ/ር አዱኛ በርጁ (DVM)
2. ዶ/ር ታከለ ታደሰ (PHD,Associate professor)
3. ዶ/ር ስለሺ ንጋቱ (DVM,VPH)

የጥናቱ ዓላማ

የዚህ ጥናት ዋና አላማ በስሜን ምዕራብ ኢትዬጲያ በሰሜን ጎንደር ዞን በሚገኙ ሆስፒታሎች ላይ የእርግዝና ክትትል የሚያደርጉ ነፍሰጡር እናቶች የ ቲ.ቢ እና መንስኤዎችን መመርመር ነው፡፡ የሚሰጡን መረጃ ይህ ጥናት በሚካሄድበት አካባቢ በተለይ በኢትዬጲያ በአጠቃላይ እናቶችን ከቲቢ በሽታ ለመከላከልና ለመቆጣጠር ለምናደርገው ዝግጅት ይረዳናል፡፡ ይህ ጥናት እድሜዓቸው ከ18 ዓመትና ከዚያ በላይ የሆኑ ነፍሰጡር እናቶች በዞኑ በሚገኙ ሆስፒታሎች በ 1271 እናቶችን ያካትታል፡፡

የጥናቱ አካሄድ

በዚህ ጥናት ውስጥ ለመሳተፍ የሚስማሙ ከሆነ የሚከተሉትን እንዲፈፀሙ እንጠይቃለን፡፡

- ከቲቢ በሽታ ጋር የሚዛመዱ ምልክቶች ስለመኖራቸው ቃለ-ምልልስ እናደርግለዎታለን፡፡

- ስለህመሙ ምልክቶች ከምናደርገው ቃለ-መጠይቅ በምናገኘው መረጃ መሰረት ሁለት ጊዜ የአክታ ናሙና እንዲሰጡ ይጠየቃሉ፡፡ አንዱ ናሙና ቃለ-መጠይቁ እንዳበቃ፣ ሁለተኛው ደግሞ በማግስቱ ጥዋት ይሰጣል፡፡
- ከጥናቱ ጋር ተያይዞ በሚሰጠው ህክምና ለምርመራ የሚፈለገውን የአክታና የደም ናሙና እንዲሰጡ የሚጠይቁበት ሁኔታ ሊኖር ይችላል፡፡
- በአጠቃላይ ግምት ቃለ-ምልልሱ አንድ ስዓት ይወስዳል፡፡

በተሳትፎ ምክንያት የሚደርስ አደጋ

በዚህ ጥናት ይደረሳል ተብሎ የሚገመት አደጋ የለም፡፡

በጥናቱ መሳተፍ የሚያስገኘው ጥቅም

በዚህ ጥናት በመሳተፍዎ በቀጥታ የሚገኝ ምንም አይነት ጥቅም የለም፡፡

የመረጃው ሚስጥራዊ አያያዝ

በዚህ ጥናት ውስጥ የሚመዘገብ መረጃ ሁሉ ደህንነቱ በተረጋገጠ ሁኔታ በምስጢር ይከማቻል፡፡ የሚታተሙ ፁሁፎች ሁሉ የእርስዎን ማንነት ይፋ የሚያደርጉ ነገሮችን አያካትቱም፡፡

መረጃን በተመለከተ

ስለጥናቱ ጥያቄ ካለዎት እባክዎ አሁን ይጠይቁኝ፡፡ ወደፊትም ቢሆን ጥያቄ ሲኖርዎት፣ ተጨማሪ መረጃ ሲያስፈልግዎት፣ በቀጣይ ተሳትፎዎን ለማቋረጥ ሲፈልጉ ደግሞ ዝም ብለው ለእኔ ይንገሩኝ፡፡ ከዚህ ጥናት በማንኛውም ጊዜ ሊሰናበቱ ይችላሉ፡፡

በጥናቱ ለመሳተፍ ፈቃደኛ ነዎት? 1. አዎ 2. አይደለም

የጥናቱ ተሳታፊ ስም_____ፊርማ_____

መጠይቁ የተካሄደበት ቀን ----------

Annex 2 …… Declaration

I, the undersigned, senior MPH student declare that this thesis is my original work in partial fulfillment of the requirements for the degree of Master of Public Health.

Student's Name**:** Adugna Berju (DVM)

Signature ---------- **Date**----------

Place of submission: Institute of Public Health. College of Medicine and Health Science University of Gondar.

Date of submission: _____

This thesis work has been submitted for examination with my/our approval as university advisor (s)

Approval of the advisors:

Advisors' Name	Signature	Date

1. Dr. Takele Tadesse(PHD, Associate professor) _____
2. Dr. Seleshe Nigatu (DVM, VPH) _____

Annex 3 Assurance of investigator

The undersigned agree to accept responsibility for the scientific, ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of the research and publications office of the university of Gondar.

Student's Name: Adugna Berju

Signature: _____ Date: _____

Approval of the advisors:

Advisors' Name	Signature	Date
1. Dr. Takele Tadesse(PHD, Associate professor)	_____	
2. Dr. Seleshe Nigatu (DVM, VPH)	_____	